TECHNICAL INFORMATION AND SERVICE DATA

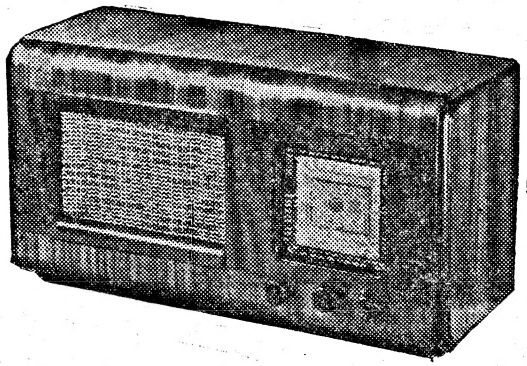
RADIOLAS

Models 515-M, 616-T & 716-C

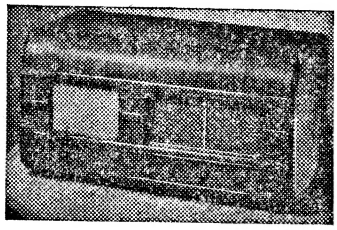
FIVE VALVE, TWO BAND, BATTERY/VIBRATOR OPERATED SUPERHETERODYNES

ISSUED BY

AMALGAMATED WIRELESS (A/SIA.) LTD.



515-M



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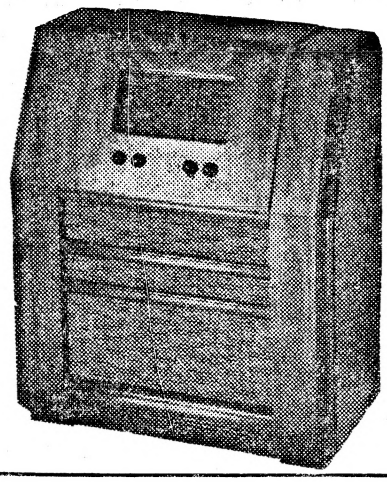


716-C

ELECTRICAL SPECIFICATIONS.

FREQUENCY RANGES:

Medium Wave 1600-540 Kc/s ..... (187.5-555 M.)

Short Wave 18-6 Mc/s ..... (16-50 M.)

INTERMEDIATE FREQUENCY ..... 455 Kc/s

BATTERY COMPLEMENT:

	Cable with tips.	Cable with plugs.
(1) 1—4 volt accumulator (2) 2—45 volt "B" batteries	19183	19803
(1) 1—1.5 volt dry cell "A" battery (2) 2—45 volt "B" batteries	19182	19801

NOTE: If a 1.5 volt dry cell "A" battery is used, it is necessary, if dial illumination is required, to remove the dial lamp cable from the terminals on top of the chassis and to connect the cable to the outer terminals of a 4.5 volt battery—see diagram "Battery Connections."

VIBRATOR POWER UNIT OPERATION:-

1—4 volt accumulator.

Vibrator Power Unit No. 19190.

BATTERY CONSUMPTION:

4 volt "A" battery	0.2 amp.
1.5 volt "A" battery	0.3 amp.
"B" battery	16 mA
Vibrator operation	0.8 amp.

DIAL LAMP ..... 6.3 volt, 0.25 amp.

FUSE:

Battery Operation	$\frac{1}{4}$-$\frac{3}{8}$ amp.
Vibrator Operation	3 amp.

CIRCUIT CODE — Model 616-T

Code No.	Description.	Part No.
	INDUCTORS.	
L1	I.F. Filter (including C1)	9382
L2, L3	Aerial Coil, 1600-540 Kc/s	15454
L4, L5	Aerial Coil, 18.6 Mc/s	15456
L6, L7	Oscillator Coil, 1600-540 Mc/s	9206A
L8, L9	Oscillator Coil, 18-6 Mc/s	15922
L10, L11	1st I.F. transformer	22416
L12, L13	2nd I.F. transformer	22416
L14, L15	3rd I.F. transformer	15483
L16	L.T. choke (audio)	XA18
	RESISTORS.	
R1	10,000 ohms, 1 watt	
R2	0.1 megohm, ½ watt	
R3	0.1 megohm, ½ watt	
R4	1.6 megohm, ½ watt	
R5	50,000 ohms, ½ watt	
R6	20,000 ohms, ½ watt (in 3rd I.F.)	
R7	0.5 megohm volume control	20293
R8	10 megohms, 1 watt	
R9	3.2 megohms, 1 watt	
R10	1 megohm, ½ watt	
R11	0.5 megohm, ½ watt	
R12	320 ohms, ½ watt	
R13	0.5 megohm, ½ watt	
R14	320 ohms, ½ watt	
R15	25 ohms, 1 watt	
R16	56 ohms, 1 watt	
R17	10,000 ohms, ½ watt	
	CAPACITORS.	
C1	50 uuF silvered mica	
C2	3-25 uuF air trimmer	19659
C3	3-25 uuF air trimmer	19659
C4	0.05 uF paper, 200 v. working	
C5	3-25 uuF air trimmer	19659
C6	9 uuF mica	
C7	3-25 uuF air trimmer	19659
C8	4000 uuF mica padder ± 2½%	
C9	0.05 uF paper, 200 v. working	
C10	12-430 uuF tuning (ganged)	20460
C11	12-430 uuF tuning (ganged)	20460
C12	Neutralising	
C13	70 uuF mica	
C14	470 uuF mica padder ± 2½%	
C15	70 uuF mica	
C16	70 uuF mica	
C17	0.05 uF paper, 200 v. working	
C18	0.1 uF paper, 200 v. working	
C19	70 uuF mica	
C20	70 uuF mica	
C21	100 uuF mica (in 3rd I.F.)	
C22	0.05 uF paper, 200 v. working	
C23	70 uuF mica (in 3rd I.F.)	
C24	100 uuF mica (in 3rd I.F.)	
C25	0.01 uF paper, 600 v. working	
C26	20 uF 200 P.V. Electrolytic	
C27	400 uF 12 P.V.	
C28	100 uuF mica	
C29	0.1 uF paper, 200 v. working	
C30	0.01 uF paper, 600 v. working	
C31	0.1 uF paper, 200 v. working	
C32	0.005 uF paper, 600 v. working	
C33	0.025 uF paper, 400 v. working	
C34	400 uF 12 P.V.	
	TRANSFORMER.	
T1	Loudspeaker transformer	XA8
	SWITCHES.	
S1	Range Switch	20507
S2	Battery/Tone Switch	22632
S3	Dial Lamp Switch	15915
	LOUDSPEAKER.	
	7 inch permanent magnet	AY40

D.C. RESISTANCE OF WINDINGS.

Windings.	D.C. Resistance in ohms.
Aerial Coil (M.W.)—	
Primary (L2)	18
Secondary (L3)	6
Aerial Coil (S.W.)	
Primary (L4)	3
Secondary (L5)	*
Oscillator Coil (M.W.)—	
Primary (L6)	*
Secondary (L7)	2
Oscillator Coil (S.W.)—	
Primary (L8)	*
Secondary (L9)	*
I.F. Transformer Windings	11
I.F. Filter (L1)	45†
L.T. Choke (L16)	*
Smoothing Choke (L75)	200
R.F. Filter Choke— (L73, L74)	*
R.F. Filter Choke— (L71, L72)	9
Loudspeaker Input Transformer (T1)—	
XA8 Primary	425 or 510
XA8 Secondary	* *
TX31 Primary	380
TX31 Secondary	*
Vibrator Transformer— (T71)—	
Primary	*
Secondary	300

The above readings were taken on a standard chassis, but substitution of materials during manufacture may cause variations and it should not be assumed that a component is faulty if a slightly different reading is obtained.

* Less than 1 ohm.

† On some receivers this reading may be as high as 60 ohms.

VALVE COMPLEMENT:

(1) 1R5 Converter.
(2) 1T4 I.F. Amplifier.
(3) 1T4 I.F. Amplifier.
(4) 1S5 Detector, A.V.C., and A.F. Amplifier.
(5) 3V4 Output.

VIBRATOR ..... A.W.A./OAK Type V6804

LOUDSPEAKER (Permanent Magnet):

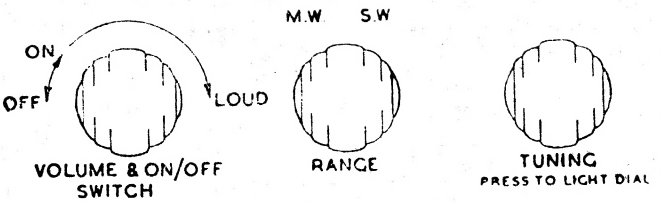
Model 515M.	Model 616-T.
5 inch—code number AC32	7 inch—code number AY40
Transformer—XA8	Transformer—XA8
V.C. Impedance 3 ohms at 400 C.P.S.	V.C. Impedance—3 ohms at 400 C.P.S.

Model 716C.

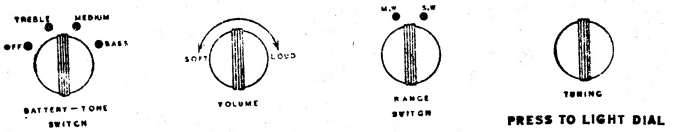
12 inch—code number AU29
Transformer—TX31
V.C. Impedance 12½ ohms at 400 C.P.S.

UNDISTORTED POWER OUTPUT ..... 200 milliwatts

CONTROLS:



MODEL 515-M



MODELS 616-T & 716-C

MECHANICAL SPECIFICATIONS.

	Height.	Width.	Depth.
Cabinet Dimensions (inches)—			
515-M	9¼	17⅜	6¾
616-T	10½	19¾	8⅞
716-C	32	30	13
Chassis Base Dimensions (ins.)	2½	11	5½
Carton Dimensions (inches)—			
515-M	9½	17¾	8½
616-T	11	20	10¼
716-C	33	31¾	14¾

Weight (nett lbs.)—

515-M	14
616-T	23
716-C	56

Cabinet Finish—

515-M	Walnut Veneer
616-T	Walnut Veneer
716-C	Walnut Veneer

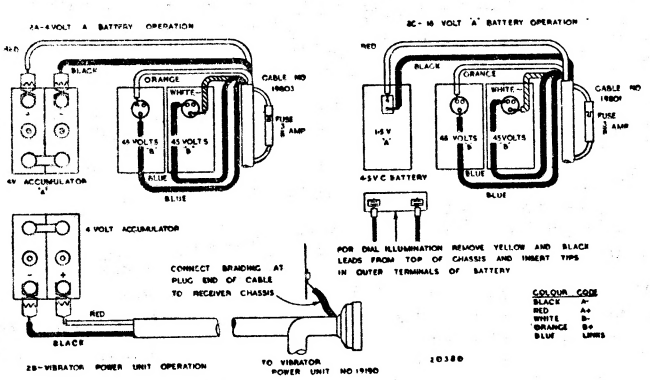
GENERAL DESCRIPTION.

The models 515-M, 616-T and 716-C are mantel, table and console models respectively. They may be either battery or vibrator operated and for battery operation either a 4-volt accumulator or a 1.5 volt dry cell "A" battery may be used, the necessary circuit modification being effected by the battery cable employed.

Battery connections are shown in the accompanying diagrams.

Design features include: Tropic-proof construction, automatic volume control, magnetite cores in I.F. transformers and broadcast oscillator coil, and air-dielectric trimming capacitors.

Models 616-T and 716-C employ straight-line edge lighted dials with metropolitan stations printed in 1/8" high characters.



ALIGNMENT PROCEDURE.

Manufacturer's Setting of Adjustments.

The receiver is tested by the manufacturers with precision instruments, and all adjusting screws are sealed. Re-alignment should be necessary only when components in tuned circuits are repaired or replaced, or when it is found that the seals over the adjusting screws have been broken.

It is especially important that the adjustments should not be altered unless in association with the correct testing instruments listed below.

Under no circumstances should the plates of the ganged tuning capacitor be bent, as the unit is accurately aligned during manufacture and cannot be re-adjusted unless by skilled operators using specialised equipment.

For all alignment operations, connect the "low" side of the signal generator to the receiver chassis, and keep the generator output as low as possible to avoid A.V.C. action. Also, keep the volume control in the maximum clockwise position.

Testing Instruments.

(1) A.W.A. Junior Signal Generator, type 2R3911

or

(2) A.W.A. Modulated Oscillator, type J6726.

If the modulated oscillator is used, connect an 0.25 megohm non-inductive resistor across the output terminals, and, for Short Wave alignment, an additional 400 ohms non-inductive resistor in series with the "high" output lead of the instrument.

(3) A.W.A. Output Meter type 2M8832.

ALIGNMENT TABLE

Order.	Connect "high" side of Generator to	Tune Generator to	Set Receiver Dial to	Adjust for Maximum Peak Output.
1	Aerial section of gang (Rear Portion)	455 kc/s	540 kc/s	L14 (Core)
2	Aerial section of gang (Rear Portion)	455 kc/s	540 kc/s	L13 (Core)
3	Aerial section of gang (Rear Portion)	455 kc/s	540 kc/s	L12 (Core)
4	Aerial section of gang (Rear Portion)	455 kc/s	540 kc/s	L11 (Core)
5	Aerial section of gang (Rear Portion)	455 kc/s	540 kc/s	L10 (Core)
	Repeat the above adjustments until the maximum output is obtained.			
6	Aerial Terminal	600 kc/s	600 kc/s	L.F. Osc. Core Adj. (L7)*
7	Aerial Terminal	1500 kc/s	1500 kc/s	H.F. Osc. Adj. (C5)
8	Aerial Terminal	1500 kc/s	1500 kc/s	H.F. Aer. Adj. (C2)
	Repeat adjustments 6, 7 and 8.			
9	Aerial Terminal	16 mc/s	16 mc/s	H.F. Osc. Adj. (C7)†
10	Aerial Terminal	16 mc/s	16 mc/s	H.F. Aer. Adj. (C3)‡

* Rock the tuning control back and forth through the signal.

† Use the minimum capacity peak if two can be obtained. Check to determine that C7 has been adjusted to correct peak by tuning the receiver to approximately 15.09 mc/s, where a weaker signal should be received.

‡ Use maximum capacity peak if two can be obtained.

Loudspeaker Service.

It is inadvisable to attempt loudspeaker repairs other than replacement of the transformer. The fitting of a new cone should be done only by Service Departments suitably equipped to do the work.

Chassis Removal.

Models 515-M and 616-T.

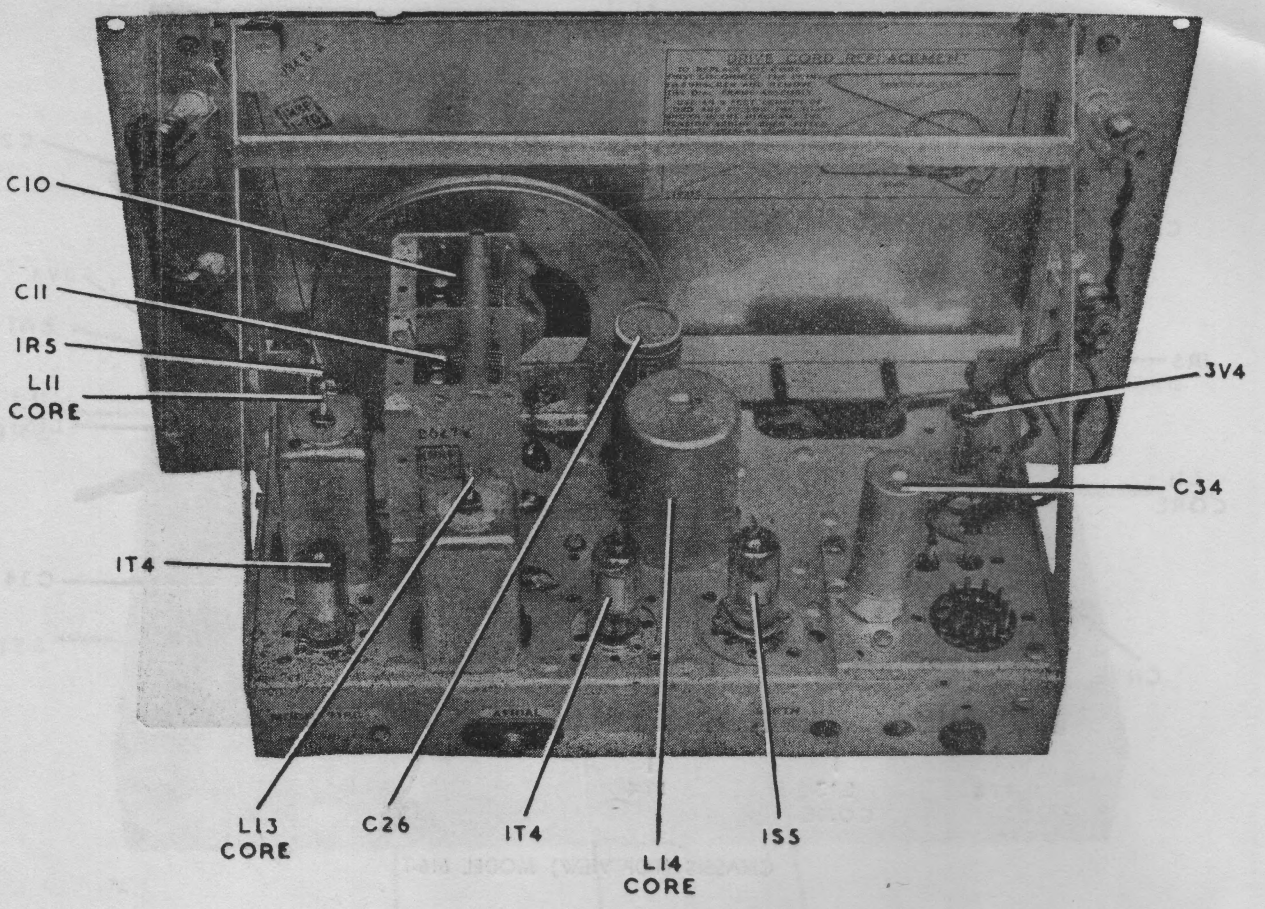
First remove the knobs and felt washers—each knob is held by a set screw. Then, remove the two screws from underneath the cabinet and withdraw the chassis.

Model 716-C.

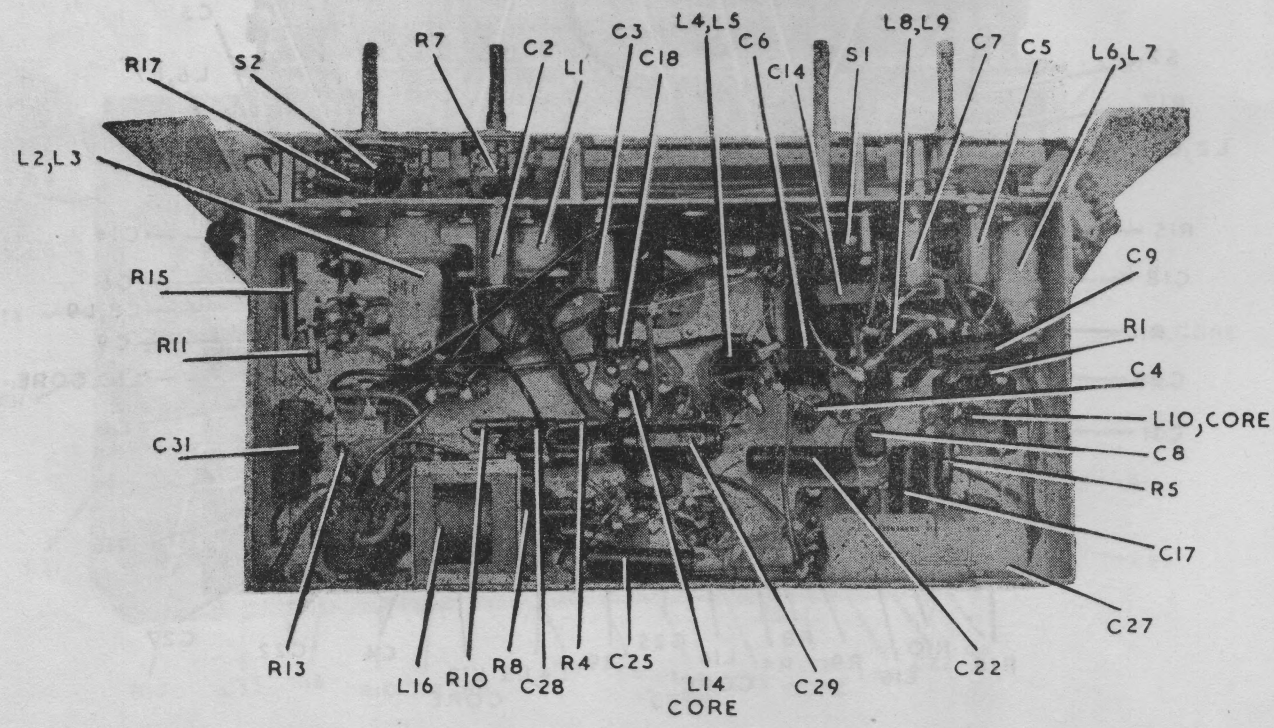
(1) Remove the knobs and felt washers. The knobs are each held by set screws.

(2) Disconnect the loudspeaker cable.

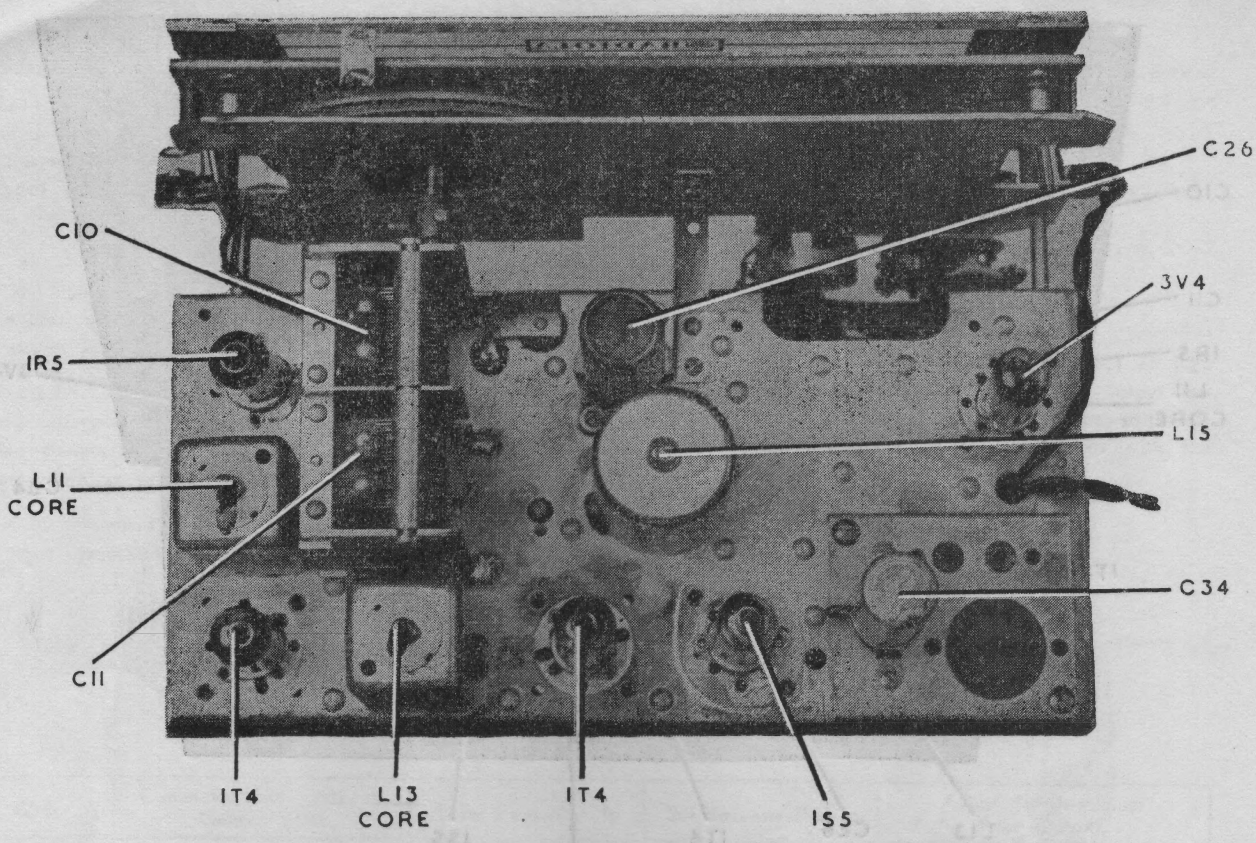
(3) The chassis is held in the cabinet by four winged nuts, two at each end of the dial frame assembly. Removal of these enables the chassis to be withdrawn from the cabinet.



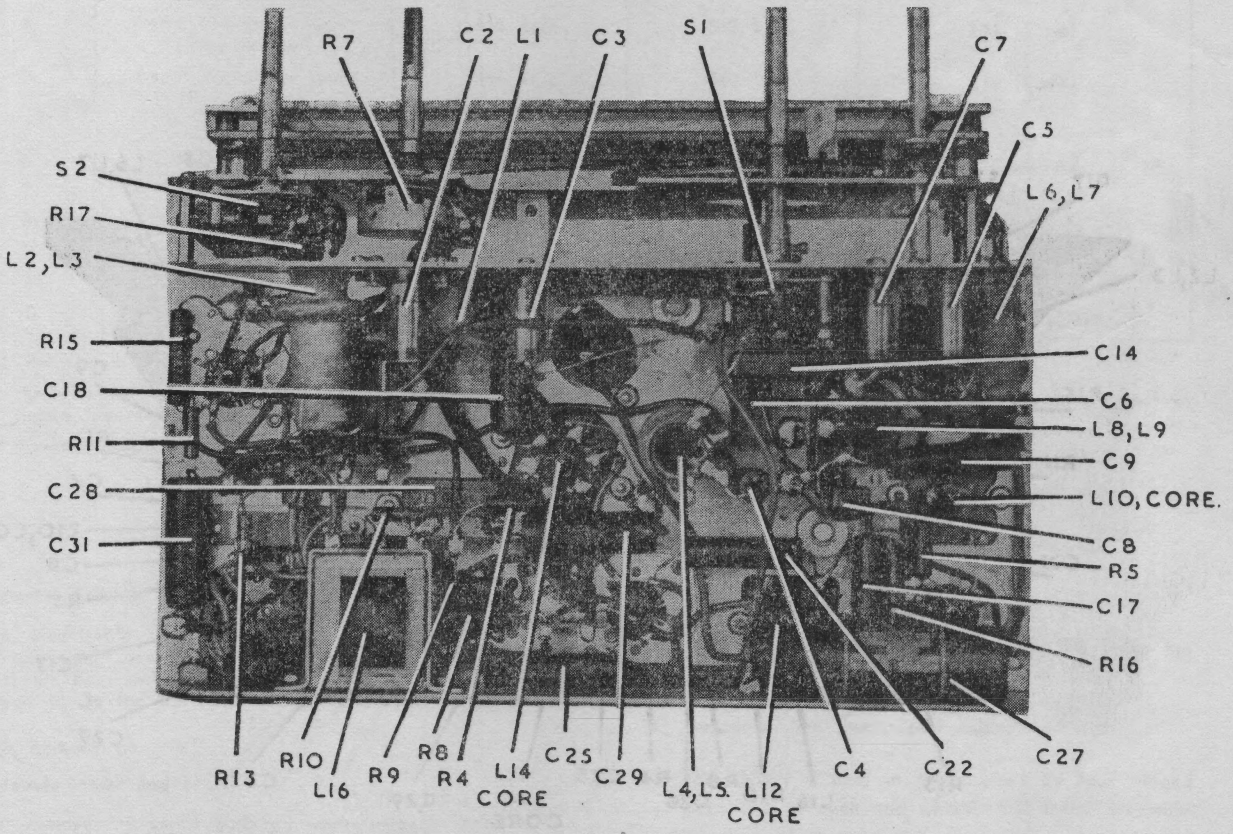
CHASSIS (TOP VIEW) MODEL 716-C



CHASSIS (UNDERNEATH VIEW) MODEL 716-C



CHASSIS (TOP VIEW) MODEL 616-T



CHASSIS (UNDERNEATH VIEW) MODEL 616-T

Dial Pointer Adjustment.

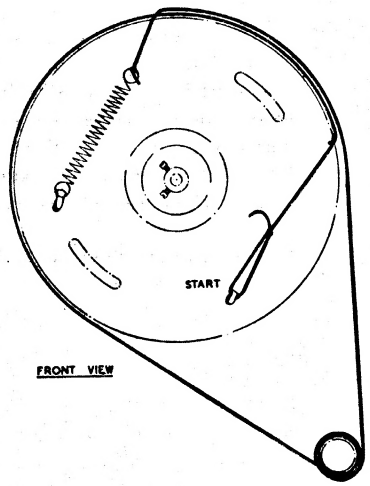
Model 515-M.

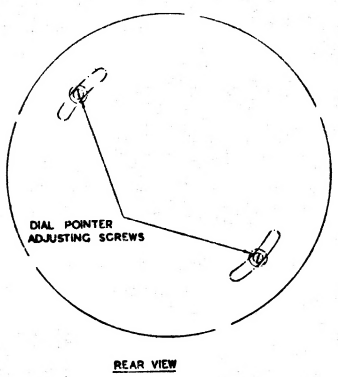
To shift the position of the dial pointer, loosen two screws in the rear of the drive drum—see accompanying diagram—move the drum to the required position, and re-tighten the screws.

Models 616-T and 716-C.

The dial pointer is held in position on the drive cord by two rubber-lined clips. To alter the position of the pointer, loosen the holding clips slightly and move the pointer in the required direction. It is important to re-clamp the clips after any adjustment of the dial pointer.

To replace the tuning drive cord, follow the diagram which is affixed to the back of the dial frame assembly. This shows the route of the cord and the method of attachment.





SOCKET VOLTAGES

Valve.	Bias Volts. B.	Bias Volts. V.	Screen to Chassis Volts. B.	Screen to Chassis Volts. V.	Anode to Chassis Volts. B.	Anode to Chassis Volts. V.	Anode Current mA. B.	Anode Current mA. V.	Filament Volts.
1R5 Converter	0	0	55*	55*	55*	55*	1.1	1.1	1.3—1.4
1T4 I.F. Amp.	0	0	35*	35*	85	87	1.4	1.4	1.3—1.4
1T4 I.F. Amp.	0	0	35*	35*	85	87	1.4	1.4	1.3—1.4
1S5 Detector	0	−1.4	25†	35†	20†	20	0.06	0.06	1.3—1.4
3V4 Output	−5	−4.5	85	87	80	82	7.5	8	1.3—1.4

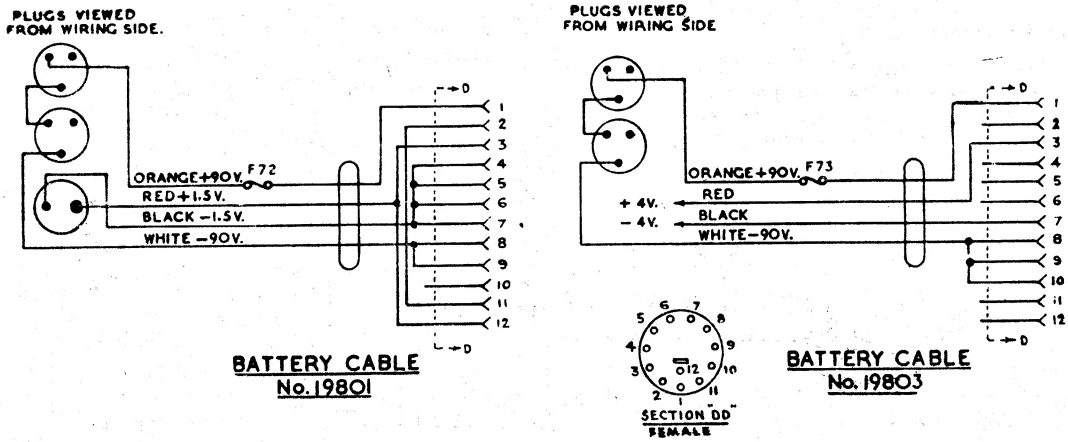
Measured with no signal input. Volume Control maximum clockwise.

* These readings may vary depending on the resistance of the voltmeter used.

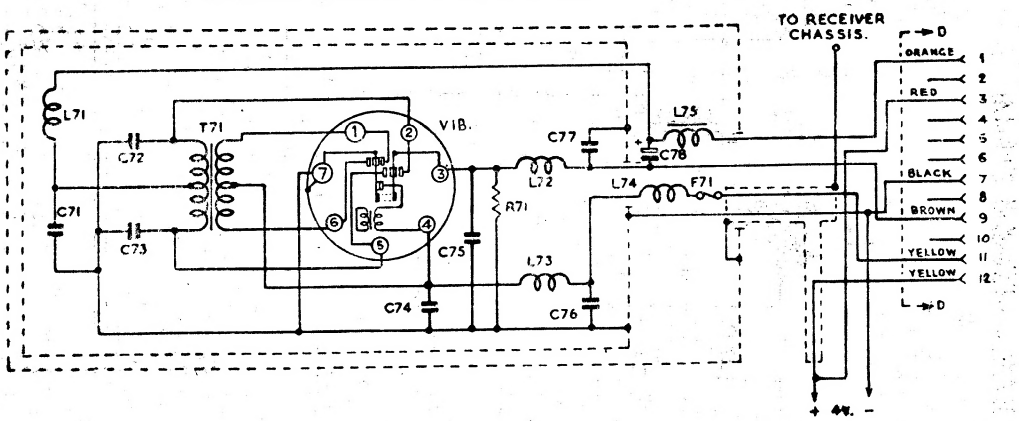
† Cannot be measured with an ordinary voltmeter.

MECHANICAL REPLACEMENT PARTS

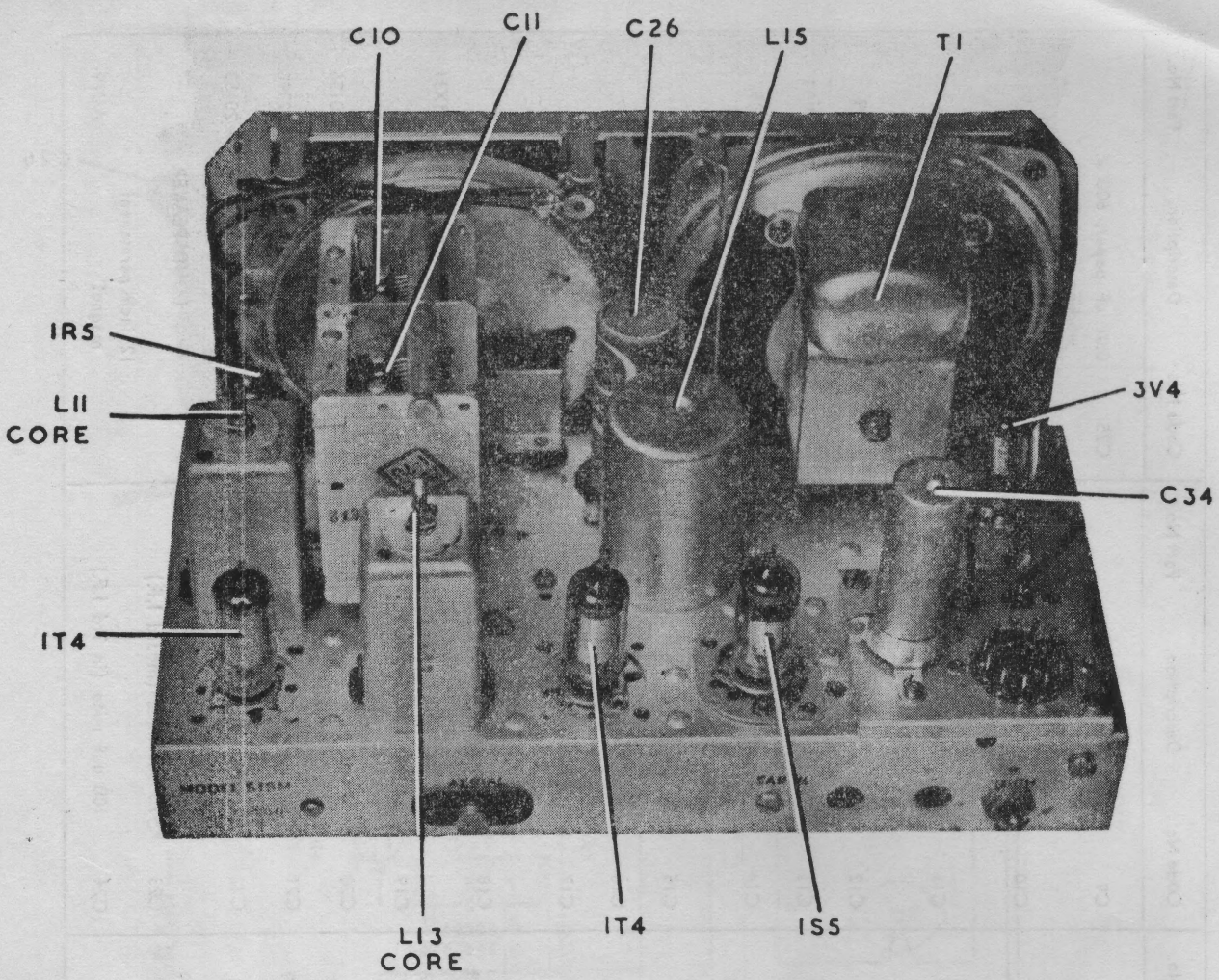
Item.	Part No.
Cabinet, 515-M	C76
Cabinet, 616-T	C83
Cabinet, 716-C	C81
Cable, battery—	With Tips. / With Plugs.
4 volt	19183 / 19803
1.5 volt	19182 / 19801
Cable, loudspeaker (616-T, 716-C only)	19188
Cable, volume control	15928
Chassis end—	
515-M, 616-T, Left-hand	20124
Right-hand	22417
716-C, Left-hand	20316
Right-hand	20318
Dial Scale—	
515-M	20008
616-T	20524
716-C	20334
Dial Pointer Assembly—	
515-M	20132
616-T	20522
716-C	20331
Drive Drum Assembly—	
515-M	20130
616-T	20130
716-C	15684
Knob—	
515-M	17603
616-T	4589
716-C	4589
Socket, valve	19965
Spindle, tuning drive—	
515-M	20650
616-T	22634
716-C	22388
Strip tag—	
515-M, 2 way	8863
3 way	8821
5 way	15926
616-T and 716-C—	
1 way	7628
2 way	8863
2 way	8021
5 way	15926
Vibrator Power Unit	19190
Terminal, aerial	17717



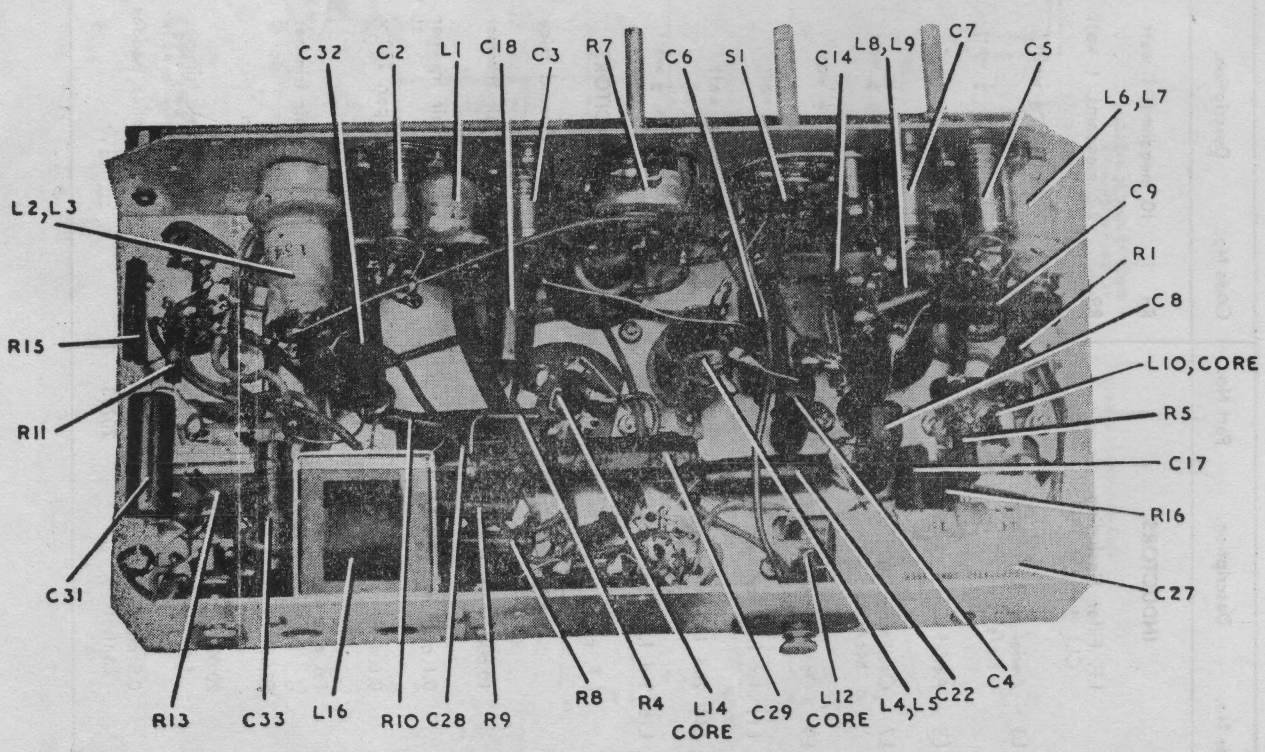
VIBRATOR POWER UNIT No. 19190



L71	R.F. choke	13809
L72	R.F. choke	13809
L73	R.F. choke	3149
L74	R.F. choke	3149
L75	R.F. choke	8321
R71	150 ohms, 1 watt, W.W.	
C71	0.01 uF paper, 600 V. working	
C72	0.02 uF paper, 600 V. working	
C73	0.02 uF paper, 600 V. working	
C74	0.1 uF paper, 400 V. working	
C75	0.01 uF paper, 600 V. working	
C76	0.1 uF paper, 400 V. working	
C77	0.01 uF paper, 600 V. working	
C78	20 uF, 200 P.V. electrolytic	
T71	Vibrator transformer	17568



CHASSIS (TOP VIEW) MODEL 515-M

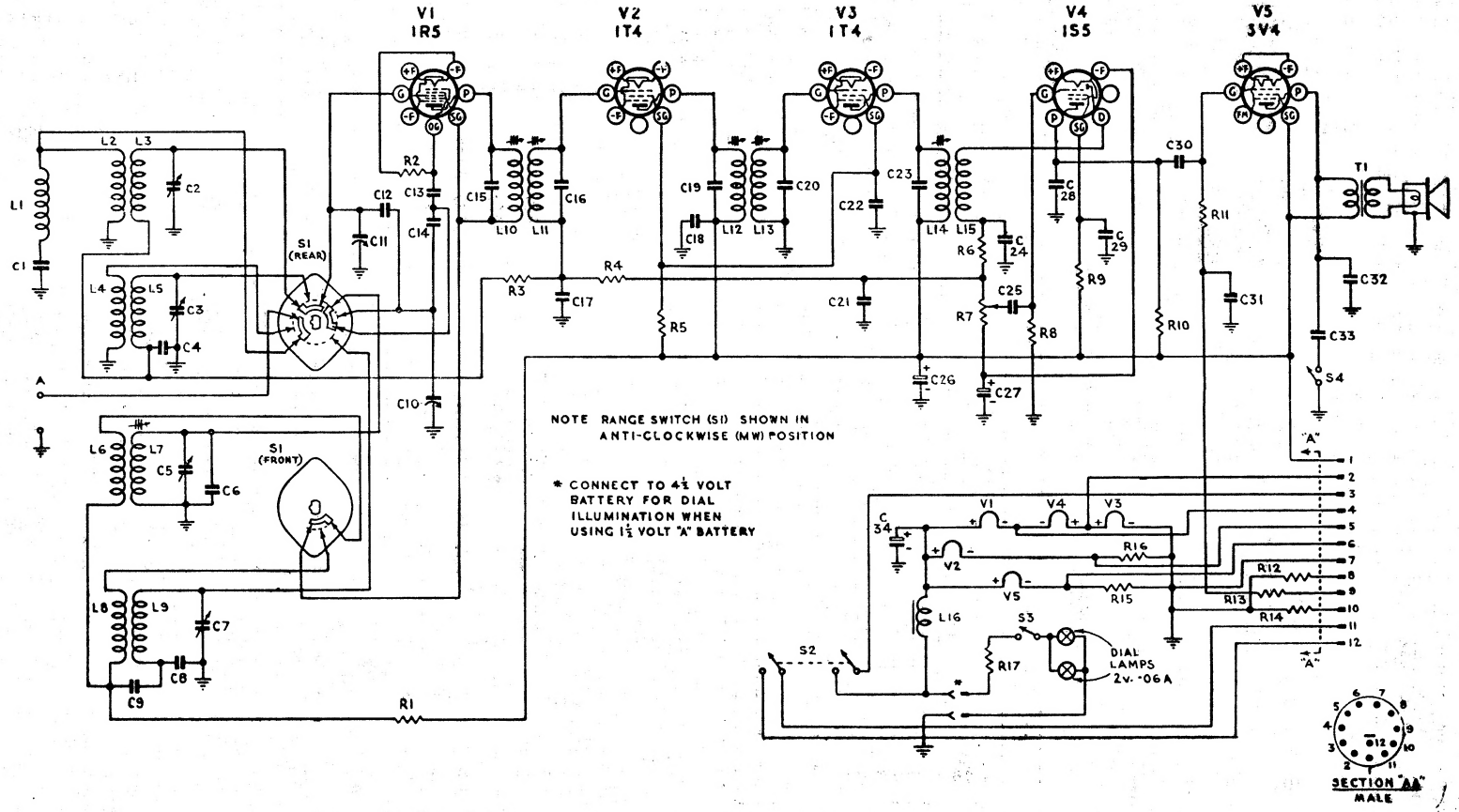


CHASSIS (UNDERNEATH VIEW) MODEL 515-M

CIRCUIT CODE — Model 716-C

Code No.	Description.	Part No.
	INDUCTORS.	
L1	I.F. Filter (including Cl.)	9382
L2, L3	Aerial Coil, 1600-540 Kc/s	15454
L4, L5	Aerial Coil, 18-6 Mc/s	15456
L6, L7	Oscillator Coil, 1600-540 Mc/s	9206A
L8, L9	Oscillator Coil, 18-6 Mc/s	15922
L10, L11	1st I.F. transformer	22416
L12, L13	2nd I.F. transformer	22416
L14, L15	3rd I.F. transformer	15483
L16	L.T. choke (audio)	XA18
	RESISTORS.	
R1	10,000 ohms, ½ watt	
R2	0.1 megohm, ½ watt	
R3	0.1 megohm, ½ watt	
R4	1.6 megohm, ½ watt	
R5	50,000 ohms, ½ watt	
R6	20,000 ohms, ½ watt (in 3rd I.F.)	
R7	0.5 megohm, volume control	20293
R8	10 megohms, 1 watt	
R9	3.2 megohms, 1 watt	
R10	1 megohm, ½ watt	
R11	0.5 megohm, ½ watt	
R12	320 ohms, ½ watt	
R13	0.5 megohm, ½ watt	
R14	320 ohms, ½ watt	
R15	25 ohms, 1 watt	
R16	56 ohms, 1 watt	
R17	10,000 ohms, ½ watt	
	CAPACITORS.	
C1	50 uuF silvered mica	
C2	3-25 uuF air trimmer	19659
C3	3-25 uuF air trimmer	19659
C4	0.05 uF paper, 200 v. working	
C5	3-25 uuF air trimmer	19659
C6	9 uuF mica	
C7	3-25 uuF air trimmer	19659
C8	4000 uuF mica padder ± 2½%	
C9	0.05 uF paper, 200 v. working	
C10	12-430 uuF tuning (ganged)	18286
C11	12-430 uuF tuning (ganged)	18286
C12	Neutralising	
C13	70 uuF mica	
C14	470 uuF mica padder ± 2½%	
C15	70 uuF mica	
C16	70 uuF mica	
C17	0.05 uF paper, 200 v. working	
C18	0.1 uF paper, 200 v. working	
C19	70 uuF mica	
C20	70 uuF mica	
C21	100 uuF mica (in 3rd I.F.)	
C22	0.05 uF paper, 200 v. working	
C23	70 uuF mica (in 3rd I.F.)	
C24	100 uuF mica (in 3rd I.F.)	
C25	0.01 uF paper, 600 v. working	
C26	20 uF 200 P.V. Electrolytic	
C27	400 uF 12 P.V.	
C28	100 uuF mica	
C29	0.1 uF paper, 200 v. working	
C30	0.01 uF paper, 600 v. working	
C31	0.1 uF paper, 200 v. working	
C32	0.005 uF paper, 600 v. working	
C33	0.025 uF paper, 400 v. working	
C34	400 uF 12 P.V.	
	TRANSFORMER.	
T1	Loudspeaker transformer	TX31
	SWITCHES.	
S1	Range Switch	20156
S2	Battery/Tone Switch	22390
S3	Dial Lamp Switch	20153
	LOUDSPEAKER	
	12 inch permanent magnet	AU29

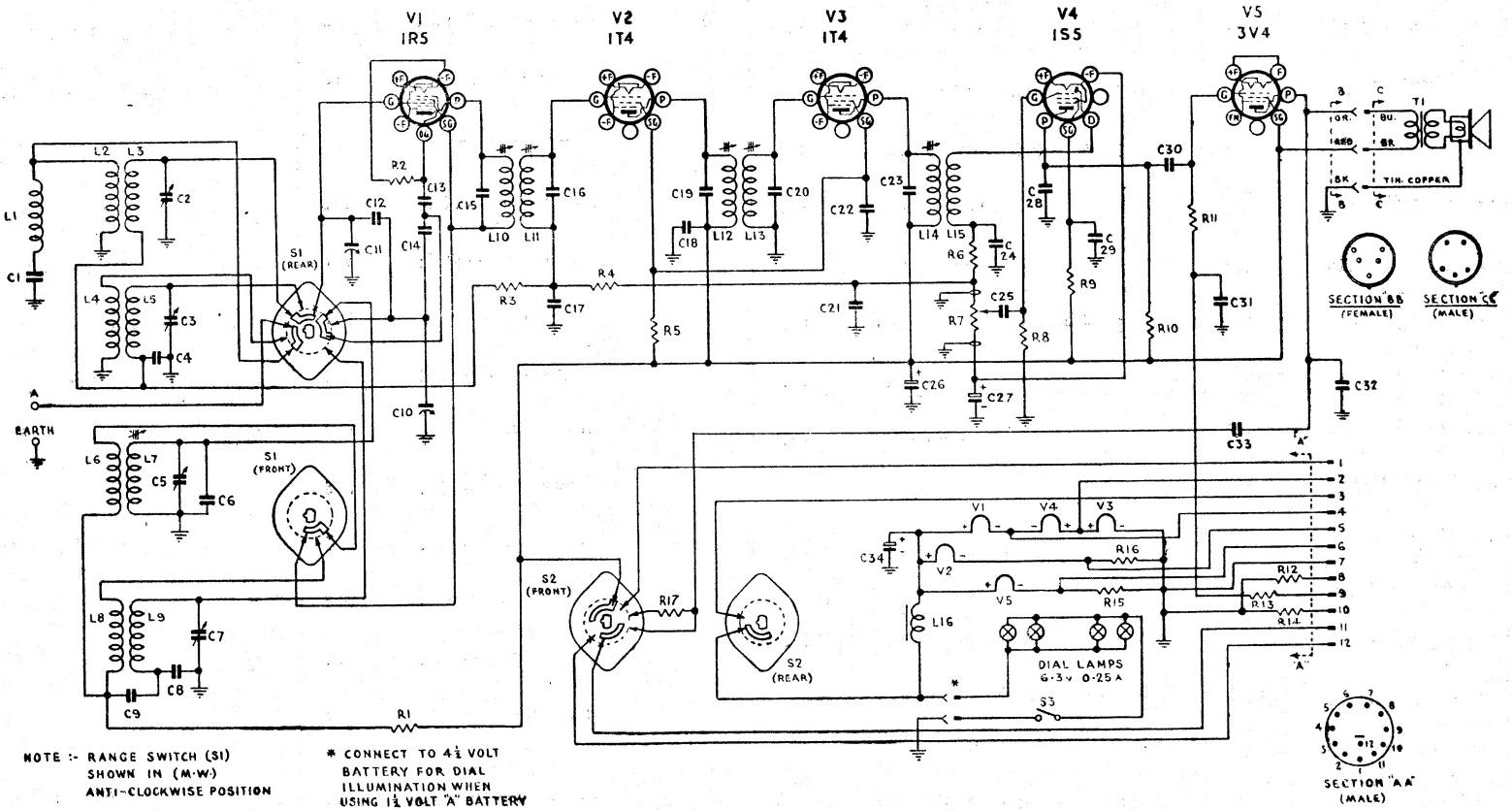
CIRCUIT DIAGRAM — Model 515-M



CIRCUIT CODE — Model 515-M

Code No.	Description	Part No.
	INDUCTORS.	
L1	I.F. Filter (including C1)	9382
L2, L3	Aerial Coil, 1600-540 Kc/s	15454
L4, L5	Aerial Coil, 18-6 Mc/s	15456
L6, L7	Oscillator Coil, 1600-540 Kc/s	9206A
L8, L9	Oscillator Coil, 18-6 Mc/s	15922
L10, L11	1st I.F. Transformer	22416
L12, L13	2nd I.F. Transformer	22416
L14, L15	3rd I.F. Transformer	15483
L16	LT Choke (Audio)	XA18
	RESISTORS.	
R1	10,000 ohms, 1 watt	
R2	0.1 megohm, ½ watt	
R3	0.1 megohm, ½ watt	
R4	1.6 megohms, ½ watt	
R5	50,000 ohms, ½ watt	
R6	20,000 ohms, ½ watt (in I.F.)	
R7	0.5 megohm Volume Control	20293
R8	10 megohms, 1 watt	
R9	3.2 megohms, 1 watt	
R10	1 megohm, ½ watt	
R11	0.5 megohm, ½ watt	
R12	320 ohms, ½ watt	
R13	0.5 megohm, ½ watt	
R14	320 ohms, ½ watt	
R15	25 ohms, 1 watt	
R16	56 ohms, 1 watt	
R17	Not used.	
	CAPACITORS.	
C1	50 uuF silvered mica	
C2	3-25 uuF air trimmer	19659
C3	3-25 uuF air trimmer	19659
C4	0.05 uF paper, 200 v. working	
C5	3-25 uuF air trimmer	19659
C6	9 uuF mica	
C7	3-25 uuF air trimmer	19659
C8	4,000 uuF mica	
C9	0.05 uF paper, 200 v. working	
C10	12-430 uuF tuning (ganged)	18286
C11	12-430 uuF tuning (ganged)	18286
C12	Neutralising	
C13	70 uuF mica	
C14	470 uuF mica	
C15	70 uuF mica	
C16	70 uuF mica	
C17	0.05 uF paper, 200 v. working	
C18	0.1 uF paper, 200 v. working	
C19	70 uuF mica	
C20	70 uuF mica	
C21	100 uuF mica (in I.F.)	
C22	0.05 uF paper, 200 v. working	
C23	70 uuF mica (in I.F.)	
C24	100 uuF mica (in I.F.)	
C25	0.01 uF paper, 600 v. working	
C26	20 uF, 200 P.V. Electrolytic	
C27	400 uF, 12 P.V.	
C28	100 uuF mica	
C29	0.1 uF paper, 200 v. working	
C30	0.01 uF paper, 600 v. working	
C31	0.1 uF paper, 200 v. working	
C32	0.005 uF paper, 600 v. working	
C33	0.025 uF paper, 400 v. working	
C34	400 uF, 12 P.V.	
	TRANSFORMERS.	
T1	Loudspeaker Transformer	XA8
	SWITCHES.	
S1	Range Switch	20156
S2	Battery Switch (inc. in R7)	
S3	Dial Lamp Switch	20153
S4	Tone Switch	20109
	LOUDSPEAKER.	
	5 inch Permanent Magnet AC32	

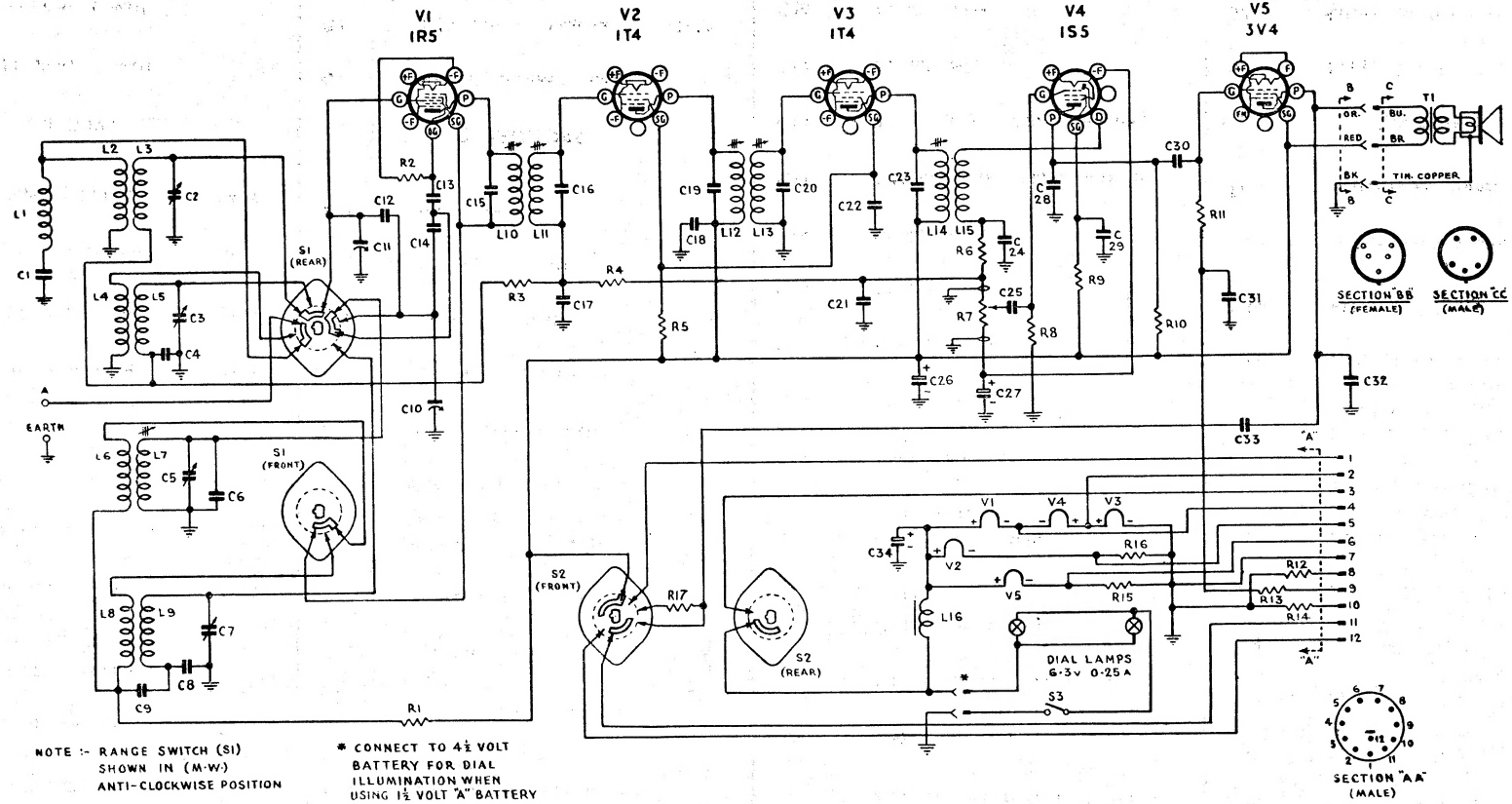
CIRCUIT DIAGRAM — Model 716-C



NOTE :- RANGE SWITCH (S1) SHOWN IN (M·W.) ANTI-CLOCKWISE POSITION

* CONNECT TO 4½ VOLT BATTERY FOR DIAL ILLUMINATION WHEN USING 1½ VOLT "A" BATTERY

CIRCUIT DIAGRAM — Model 616-T



NOTE :- RANGE SWITCH (S1) SHOWN IN (M·W·) ANTI-CLOCKWISE POSITION

* CONNECT TO 4½ VOLT BATTERY FOR DIAL ILLUMINATION WHEN USING 1½ VOLT "A" BATTERY